IntelliZone2

Comfort Zoning System

Six Zone Capability

IntelliZone2 Installation Manual

Installation Information

Damper Installation

Thermostat Installation

Electrical

Startup Procedures

Wiring Schematic

WaterFurnace
Smarter from the Ground Up™

IM1578EW 07/12

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IntelliZone2

The IntelliZone2 Components

IntelliZone2 Relay Board

The IntelliZone2 relay board provides basic relay logic for the damper operation and serves as a common connection point for all IntelliZone2 thermostats and the heat pump.

IntelliZone2 MasterStat

The IntelliZone2 MasterStat is the master control for the system and has all of the programming for operation. It is a 4.3 in. communicating color touch screen device that also functions as a zone thermostat for Zone 1. Optional remote sensor capability is also available.

IntelliZone2 ZoneStat

The IntelliZone2 ZoneStat is a zone thermostat option for any of Zones 2 through 6. It has full setback capability and communicates to the IntelliZone2 system.

IntelliZone2 SensorStat

The IntelliZone2 SensorStat is a zone thermostat option for any of Zones 2 through 6. It has full setback capability (through the MasterStat interface only) and communicates to the IntelliZone2 system.

General Installation Information

Safety Considerations

Installing and servicing heating and air conditioning equipment can be hazardous due to system electrical components. Only trained and qualified service personnel should install, repair or service heating and air conditioning equipment. When working on equipment, observe precautions in the literature, tags and labels attached to the unit, and other safety precautions that may apply. Follow all safety codes. Wear safety glasses and work gloves.

WARNING: Before performing service or maintenance operations on the system, turn off main power switches to the indoor unit. Turn off accessory heater power switch if applicable. Electrical shock could cause serious personal injury.

Delivery Information

When the equipment is received, all items should be carefully checked against the bill of lading to be sure all crates and cartons have been received. Examine the contents for shipping damage, removing them from the cartons if necessary. If any damage is noted, the carrier should make the proper notation on the delivery receipt, acknowledging the damage.

General rules to follow when installing a zone system:

CAUTION: When installing the IntelliZone2 in a structure with fossil fuel (oil, gas, propane) appliances, it is important that both supply and return dampers are used in each zone to avoid potential back-drafting of fossil-fueled appliances.

- Up to six zones on variable speed, up to four zones with dual capacity units (two with single-speed units).
- All dampers should be located as close to the main trunk as possible to limit the amount of pressurized trunk line and thus limit air leakage.
- No less than three branch runs in a zone to prevent a single branch obstruction (curtains or clothes etc.) from affecting unit airflow.
- Insulate and seal around rectangular dampers to prevent leakage.
- All dampers must be wired with 18-gauge wire. **NOTE:** Crimp connections should never be used on solid conductor wire.
- Ensure that the transformer can handle the power requirements of the system.
- No more than three dampers per zone.
- Ductboard-mounted dampers should be supported within six inches of the damper due to the weight and stress on the ductboard.

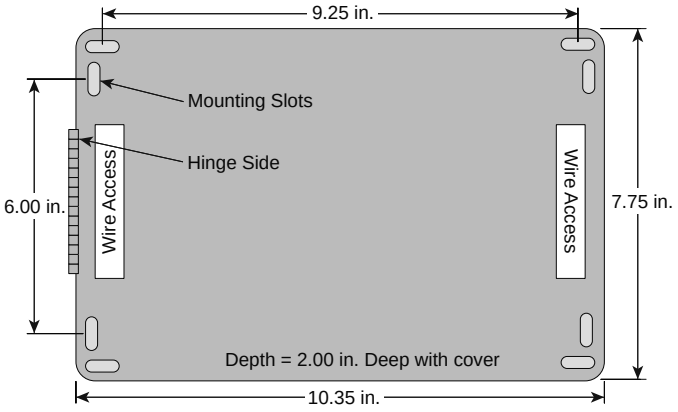
Installation and Design Steps

1. Decide which areas of a home or office will comprise each of the individual zones. A maximum of six individual zones (four with dual capacity and two with single-speed equipment) can be chosen.
2. Calculate loads using software or other recognized methodology.
3. Use software to determine the equipment size and performance based on the total heating and cooling demands of the building, not the sum of the individual zone demands.
4. Find the peak heating and cooling demands and the peak cfm required for each of the zones.
5. Determine zone design air flow and zone size settings using IntelliZone2 Calculator software.
6. Lay out and size the supply air ductwork and dampers. Care should be taken to avoid under sizing either the supply air systems, return air systems, or diffusers.
7. Decide where to locate the thermostats.
8. Install the unit and the IntelliZone2 Comfort Zoning system.

IntelliZone2 Control Panel

Locate the IntelliZone2 panel in an indoor area that has enough space for service personnel to perform maintenance or repair. Provide sufficient room to make electrical connection(s). The IntelliZone2 is not approved for outdoor installation and, therefore, must be installed inside the structure being conditioned. Do not locate the control panel in areas where ambient conditions are not maintained within 45°F to 95°F and are greater than 75% relative humidity. The IntelliZone2 control panel should be mounted on or as close to the unit as possible by using the sheet metal screws provided. See Figure 1 for mounting hole locations.

Figure 1: IntelliZone2 Relay Panel Mounting



NOTE: Use longer screws (not provided) to penetrate through drywall into stud.

Damper Installation

Installing Rectangular Dampers in Metal Ductwork

1. Cut out dimensions A and B as shown in Figure 2 by using sheet metal snips. **NOTE:** Dimensions A and B are listed in the Dimensional Examples table.
2. Use foam insulation tape on the top and bottom of the zone damper to prevent excessive air bypass. Also check the cross emboss for excessive air bypass (see Figure 2).
3. Slide the zone damper into the ductwork making sure no obstructions will interfere with damper blade operation.
4. Use the screws provided to mount the damper flange to the ductwork. Four to six mounting holes are provided as shown in Figure 3.
5. Use drive cleats or regular duct mounting brackets to attach ductwork to joist within six inches on both sides of the damper (see Figure 3).
6. Check damper blade operation for obstructions by holding the manual release button and rotating the damper shaft CW (Open) and CCW (Closed) 3 Wire only as shown in Figure 4.

Dimensional Examples

Damper Model	H	W	A	B
ZDR1024	10 in.	24 in.	10 in.	3.75 in.
ZDR0812	8 in.	12 in.	8 in.	3.75 in.

Six Zone System Representational Layout

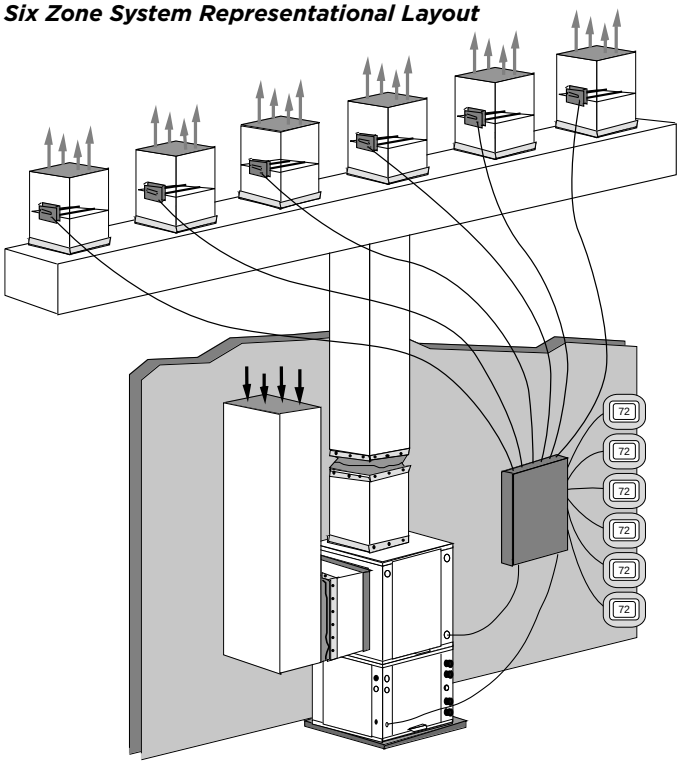


Figure 2: Foam Taping Zone Damper

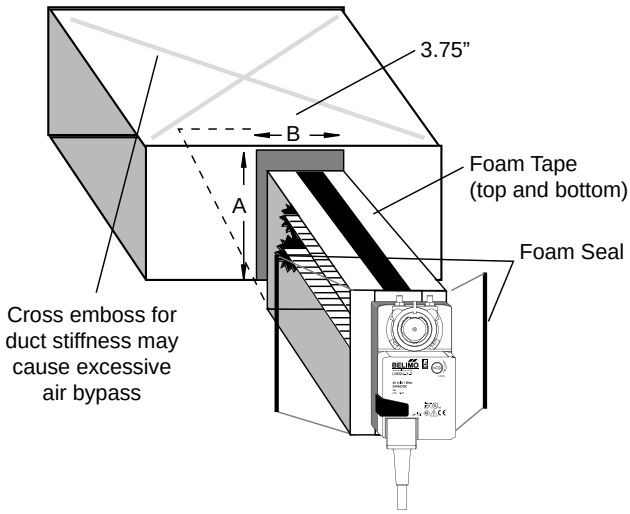


Figure 3: Mounting Damper

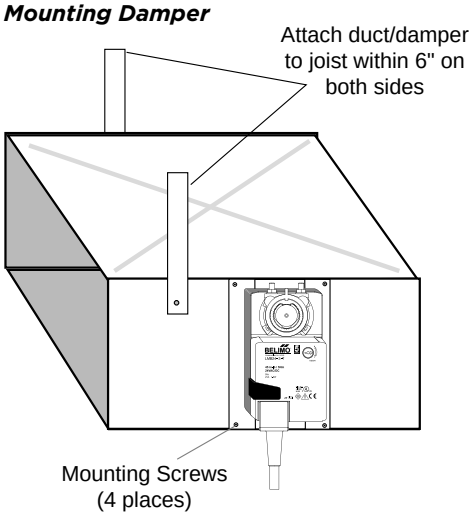
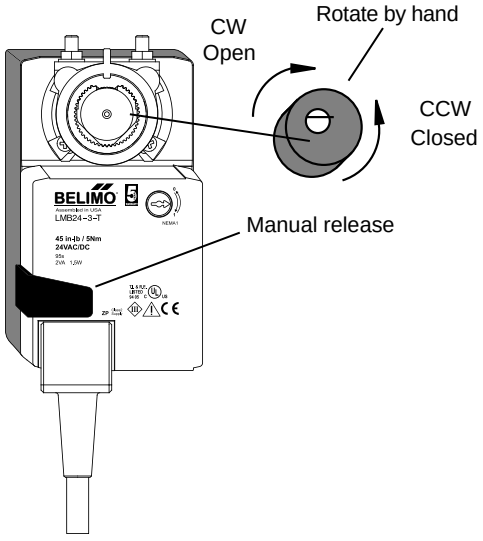


Figure 4: Checking Damper Blade for Obstructions



Damper Installation cont.

Insulating Rectangular Dampers in Metal Ductwork

Insulate ductwork as shown in Figure 5. All metal must be covered. Care must be taken not to obstruct the shaft from rotating when insulating. Do not insulate the zone damper actuator.

Installing Rectangular Dampers in Ductboard

1. Cut out dimensions A and B by using a ductboard knife. **NOTE:** Dimensions A and B are listed in the Dimensional Examples table.
2. A ductboard spacer should be installed on the end of the damper frame as shown in Figure 7 to prevent excessive air bypass. For example: A one-inch-thick, 8 in. x 20 in. ductboard and a 8 in. x 20 in. zone damper would have a one-inch gap at the end of the frame once it is installed without a ductboard spacer. Use the piece cut out for installation.
3. Foam insulation tape should be used on the top and bottom of the zone damper to prevent excessive air bypass as shown in Figure 7.
4. Slide the zone damper into the ductboard making sure no obstructions will interfere with damper blade operation.
5. Tape the damper face flange to the ductboard using foil tape making sure the damper is secure and air tight as shown in Figure 8.
6. Support the full length of the ductboard underside within six inches and on both sides of the damper as shown in Figure 8.
7. Check the damper blade operation for obstructions by holding the manual release button and rotating the damper shaft CCW and CW (see Figure 4).

Figure 5: Insulating Rectangular Metal Ductwork

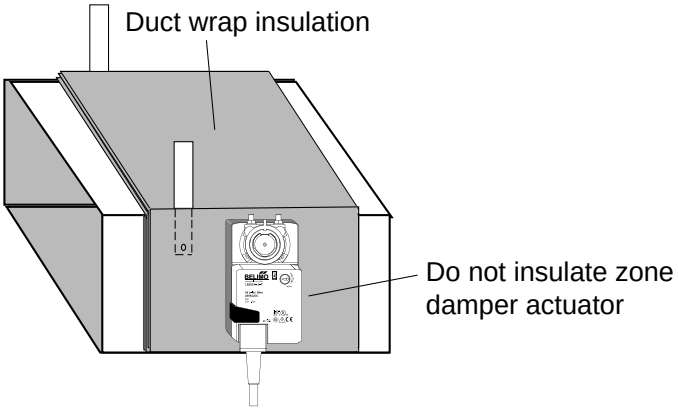


Figure 7: Taping Zone Damper with Foam Tape

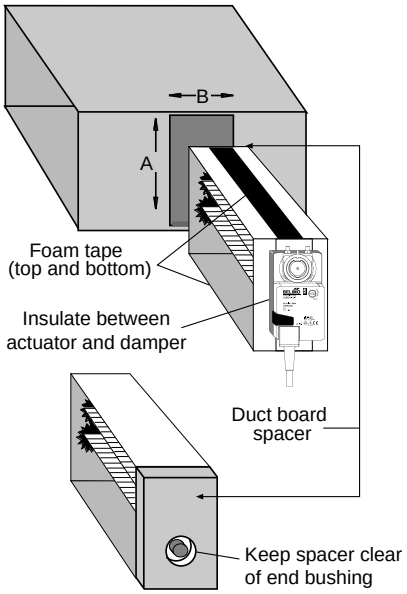
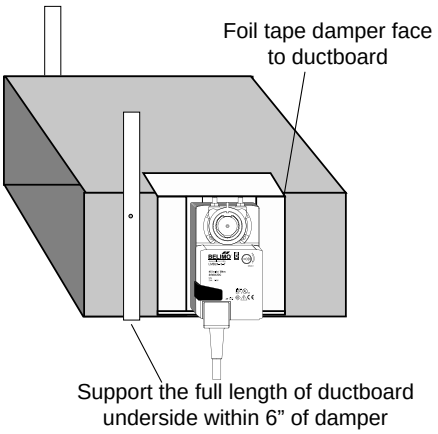


Figure 8: Taping Damper Flange to Ductboard



Damper Installation cont.

Insulating Rectangular Ductboard/ Metal Sleeve

Care must be taken not to obstruct the shaft from rotating when insulating. Do not insulate the zone damper actuator.

Installing Circular Dampers in Round Metal Duct

1. Crimp the end of the duct that is the supply air to damper. Insert into circular damper no more than 1.5 inches.
2. Fasten the duct to the damper with three screws. Screws installed more than one inch from either end may obstruct damper blade rotation.
3. Seal completely around the duct with metal duct tape or mastic to prevent air leakage as shown in Figure 10.
4. Check the damper blade operation for obstructions by holding the manual release button and rotating damper shaft CCW and CW (3 wire only). See Figure 4.
5. Support the duct to joist within six inches of the damper as shown in Figure 9.

Insulating Circular Dampers in Round Metal Duct

Insulate ductwork as shown in Figure 10. All metal must be covered to prevent condensation. Care must be taken not to obstruct the shaft from rotating when insulating. Do not insulate the zone damper actuator.

Installing Circular Dampers in Flexible Duct

1. Slide flexible duct two to three inches over the damper pipe past the damper rib as shown in Figure 11.
2. Fasten duct to damper with a nylon duct strap, screwing the strap to the pipe to prevent the duct from slipping off. Screws installed more than one inch from either end may obstruct damper rotation.
3. Seal completely around the duct with metal duct tape or mastic to prevent any air leakage.
4. Check the damper blade operation for obstructions by holding the manual release button and rotating damper shaft CW (Open) and CCW (Closed) - 3 wire only. See Figure 4.
5. Support the damper to joist within six inches on both sides of the damper as shown in Figure 12.

Insulating Damper Actuators

Insulate the damper as shown in Figure 12. All metal must be covered to prevent condensation. When insulating, care must be taken not to obstruct the shaft from rotating. Do not insulate the zone damper actuator.

Figure 9: Taping Round Duct to Circular Damper

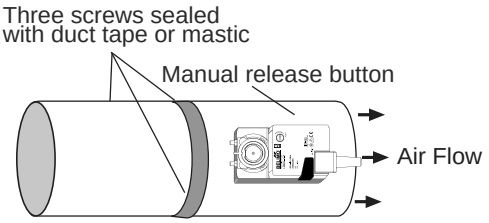


Figure 10: Supporting and Insulating Circular Damper

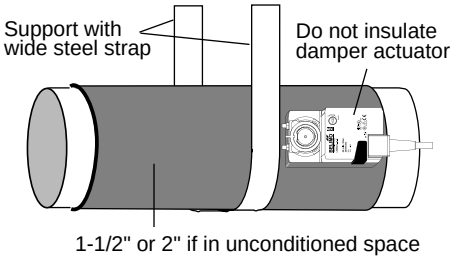


Figure 11: Attaching Flexible Duct to Damper

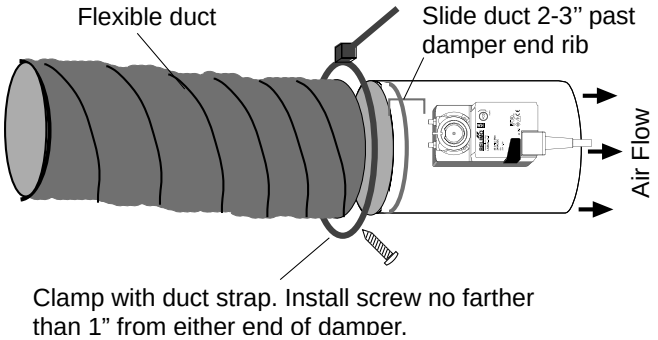
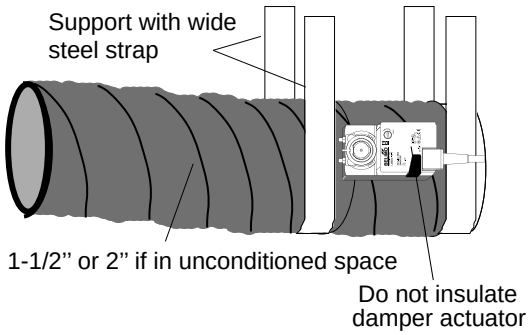

Flexible duct
Slide duct 2-3” past
damper end rib
Air Flow
Clamp with duct strap. Install screw no farther
than 1” from either end of damper.

Figure 12: Supporting and Insulating Circular Damper

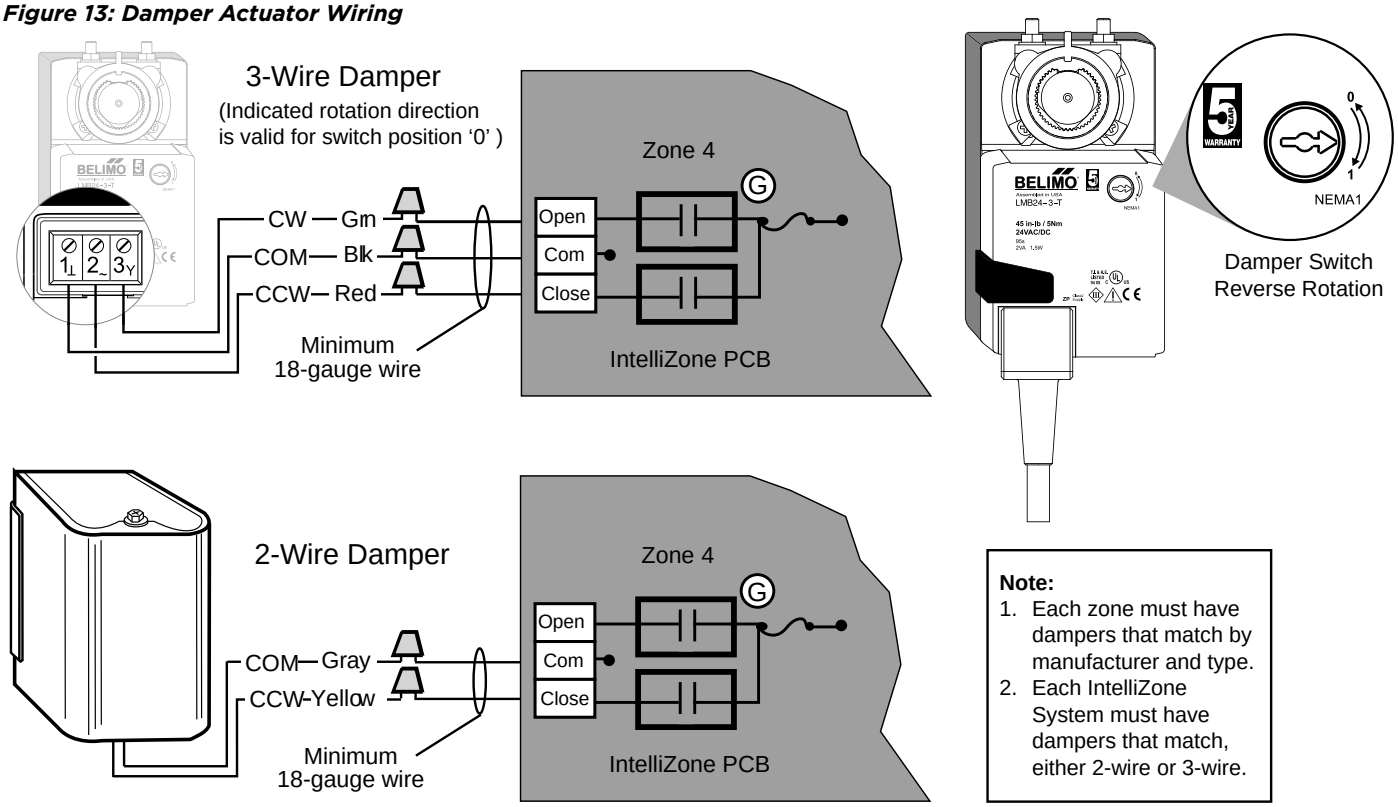


Electrical Wiring

Wiring Damper Actuators

All wiring must comply with local and state codes. Disconnect the power supply before beginning to wire to prevent electrical shock or equipment damage. All wiring should be run back to the control panel. Keep wires a minimum of 12 inches from any high voltage lines. Follow the damper wiring schematic as shown in Figure 13. Verify that damper rotation direction is correct. The 3-wire damper rotation direction is reversible with switch on front cover.

Figure 13: Damper Actuator Wiring

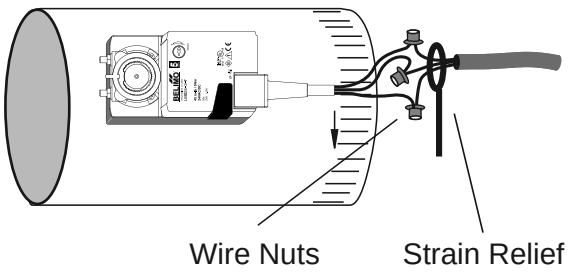


Note:
1. Each zone must have dampers that match by manufacturer and type.
2. Each IntelliZone System must have dampers that match, either 2-wire or 3-wire.

Damper Actuator Wiring Notes

1. Minimum of 18-gauge thermostat wire is recommended.
2. Use wire nuts to connect the thermostat wire to the actuator wire (solid wire to stranded wire) as shown in Figure 14.
3. The actuator wiring should be secured using a wire tie to prevent the wires from being separated (see Figure 14).

Figure 14: Actuator Wiring



Electrical Wiring cont.

Transformer Sizing

Providing adequate transformer power (VA) to supply the system is an important requirement. Each 3-wire damper requires 3.0 VA at nominal voltage. Each 2-wire damper requires 7.0 VA at nominal voltage. The standard transformer available is a 75VA with circuit breaker (Part # ZTK240).

Transformer 'VA' Calculation (3-wire actuator)

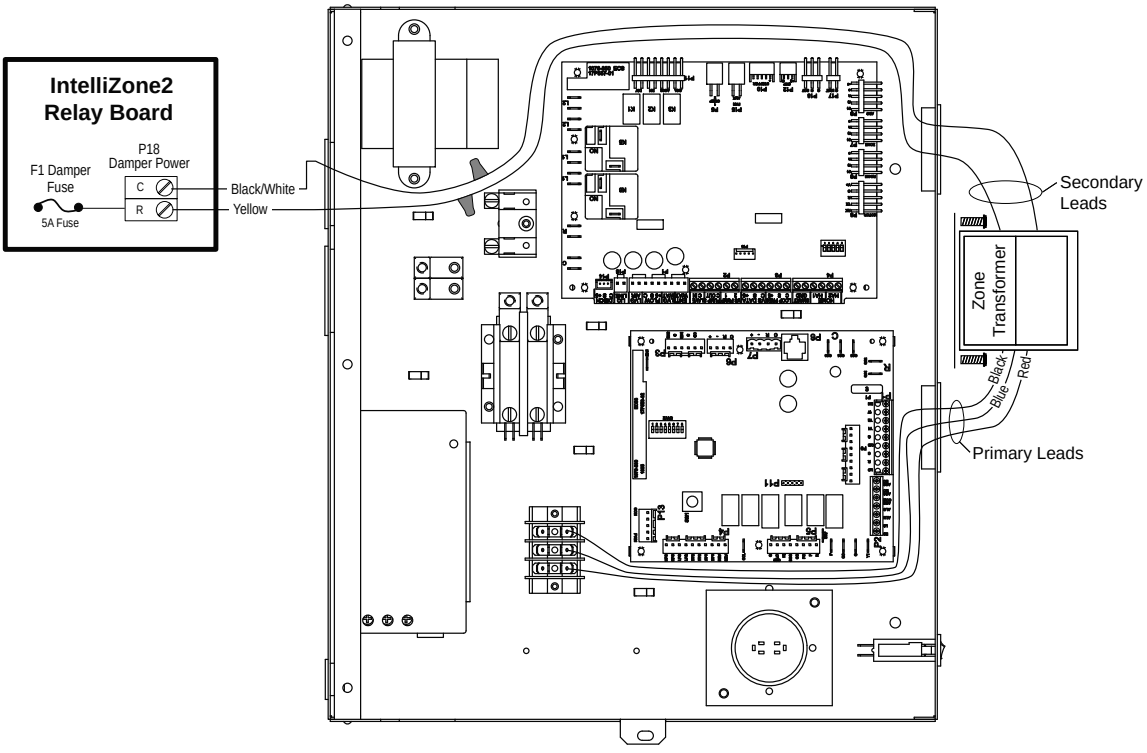
Zone 1 Dampers	Power to 2 IZ2 Dampers	6.0 VA
Zone 2 Dampers	Power to 1 IZ2 Dampers	3.0 VA
Zone 3 Dampers	Power to 2 IZ2 Dampers	6.0 VA
Zone 4 Dampers	Power to 3 IZ2 Dampers	9.0 VA
Zone 5 Dampers	Power to 2 IZ2 Dampers	6.0 VA
Zone 6 Dampers	Power to 3 IZ2 Dampers	9.0 VA
	Total VA Draw	**39.0 VA**

WARNING: All wiring must comply with local and state codes. Disconnect the power supply before beginning to wire to prevent electrical shock or equipment damage.

Mount the transformer onto the side of the unit's control box on the 5 Series and on the back of the control box on the 7 Series by inserting and tightening screws (provided) into the pre-punched holes. Thread all transformer wires through the hole with bushing and follow the wiring schematic for connecting the transformer primary and secondary leads as shown in Figure 15 (5 Series) and Figure 16 (7 Series).

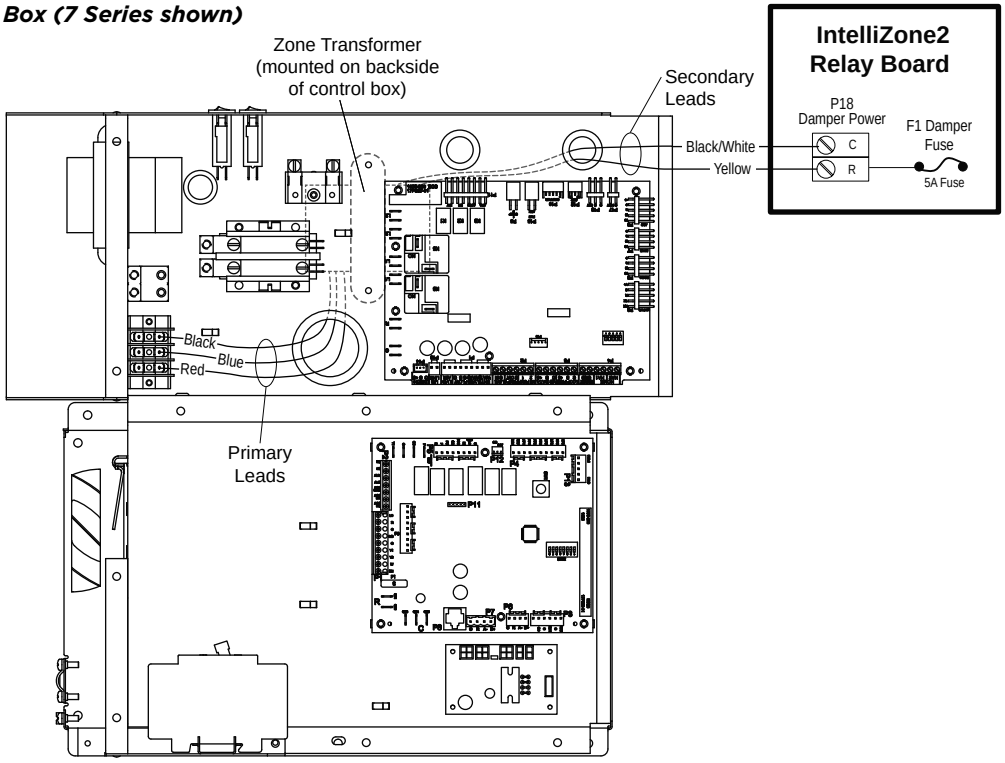
For 208 volt operation, the red and blue transformer wires must be switched. Use wire nuts only for connections to thermostat wire.

Figure 15: Mounting and Wiring Transformer to Control Box (5 Series shown)



Electrical Wiring cont.

Figure 16: Mounting and Wiring Transformer to Control Box (7 Series shown)

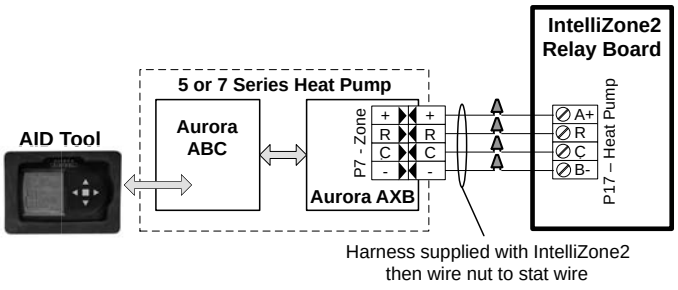


Wiring IntelliZone2 to the Unit

WARNING: All wiring must comply with local and state codes. Disconnect the power supply before beginning to wire to prevent electrical shock or equipment damage.

Follow the wiring schematic in Figure 17 for unit control connections. Strip the wires back 1/4 inch (longer strip lengths may cause shorts) and insert the thermostat wires into the unit's connector as shown in Figure 17. Tighten the screws to ensure tight connections. Use a minimum of 18-gauge thermostat wire for connections.

Figure 17: IntelliZone2 to 5 or 7 Series Control Wiring



Thermostat Installation

Locating the Thermostats

The thermostats must be located in the room or zone that each controls. Locate a thermostat about five feet above the floor. Do not locate a thermostat where it may be exposed to direct sunlight, drafts or direct supply air. Do not place a thermostat on an outside wall. Follow the same guidelines that apply with standard thermostat installation. If two or more rooms are on a single zone, locate the thermostat in a hallway or area where it can sense the return air from all rooms.

Figure 18: Four Zone Thermostat Location

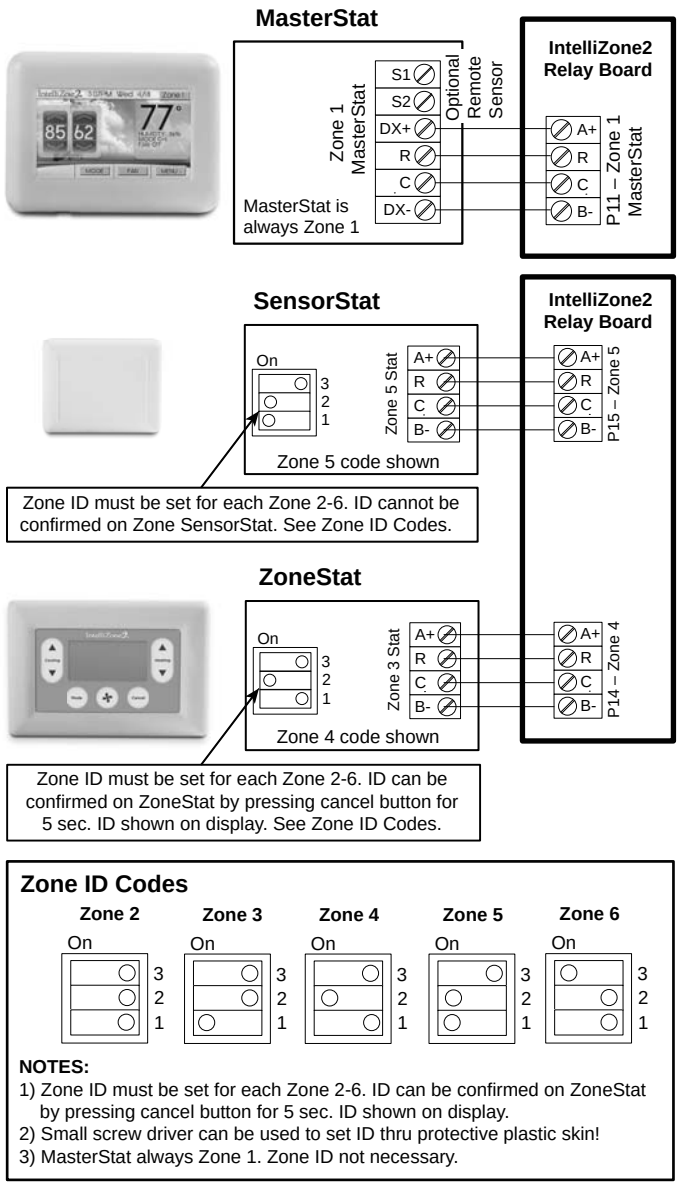
Thermostat Installation cont.

Mounting and Wiring the Thermostats

Position the thermostat subbase against the wall so that it is level and the thermostat wires protrude through the middle of the subbase. Mark the position of the subbase mounting holes and drill holes with a 3/16-inch bit. Install supplied anchors and secure base to the wall. Use 4-conductor 18 or 20 AWG thermostat wire unless issues with EMI are anticipated. In that situation, use 24 AWG shielded twisted pair cable grounded to "C" terminal on the relay board end. Strip the wires back 1/4 inch (longer strip lengths may cause shorts) and insert the thermostat wires into the IntelliZone2 connector as shown in Figure 19. Tighten the screws to ensure tight connections. The thermostat has the same type connectors, requiring the same wiring. Caulk the hole in the wall where the wires enter the thermostat.

NOTE: See the instructions enclosed in the thermostat for detailed installation and operation information.

Figure 19: Wiring the Thermostat to the IntelliZone2



Zone ID Codes
Zone 2
Zone 3
Zone 4
Zone 5
Zone 6
On
3
2
1
NOTES:
1) Zone ID must be set for each Zone 2-6. ID can be confirmed on ZoneStat by pressing cancel button for 5 sec. ID shown on display.
2) Small screw driver can be used to set ID thru protective plastic skin!
3) MasterStat always Zone 1. Zone ID not necessary.

IntelliZone2 Configuration

Aurora System and Communication Configuration of IntelliZone2

Aurora Communication Basics

The Aurora Control functions around the concept of modularity and intercommunications between these boards. The communication is a 4 wire ModBus protocol. ModBus protocol is an open source protocol becoming more popular with equipment manufacturers for use in HVAC equipment. The Aurora has one 'bus' for the ABC, AXB, AWL, VS Drive, EEV, and thermostats. The AID Tool only plugs into the ABC AID Tool port (RJ style connector) and will not work at any other location. The AXB has 3 other independent ports for differing protocols; for IntelliZone2, ClimateTalk Components, and Communicating ECM blower motors. None of these ports comply with the ModBus protocol set up for the rest of the Aurora system.

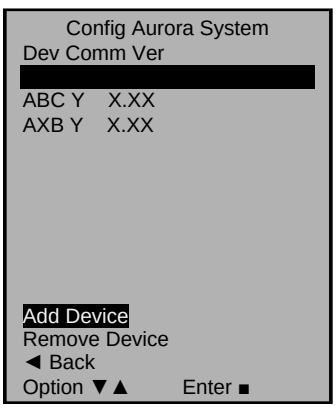
The ModBus communication is accomplished within the cabinet using shielded and ground cabling. This shield is most important in 7 Series applications where the VS Drive component, by its very nature, emits electro-magnetic interference and can interfere with ModBus communications. Round ferrite 'donuts' can be observed at various locations to aid in cleaning the communication lines. Each line is comprised of an R (+24VAC), C (common) and a '+' and '-' communication line. At times the 'R' and 'C' lines may not be connected or needed. The terminals marked '+' and '-' should not be switched, although damage may not occur to the boards, communication is not possible. The communication voltage and current are small therefore 24 awg wire is adequate for these communication lines and a shield is not required but recommended in high EMI environments.

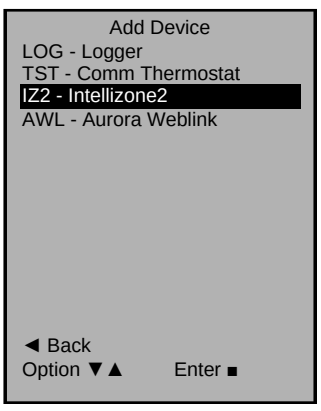
An extra 'expansion' connector is available for connecting the AWL and other devices onto the main ABC ModBus.

A small LED is located next to each of the communication ports to aid in evaluating active communication at that specific port. This is true for each board. The blinking indicates transmission or receiving communication activity.

Configuring the Aurora for the IntelliZone2

'Adding' the IntelliZone2 to the Aurora system can be accomplished using the AID Tool via the 'Config Aurora' screen and scrolling to IntelliZone2 selecting and adding.





As always a 'Y' in the communication column shows that communication is OK. This will initiate communication between the IntelliZone2 system and the Aurora AXB/ABC.

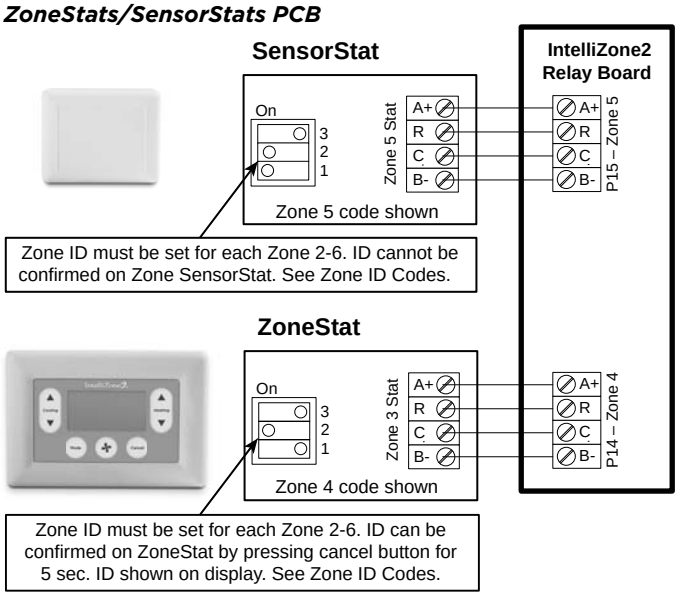
Software Versions

Software versions of the IntelliZone2 MasterStat can be found in the startup screen or in the AID Tool Aurora Config screen. Software can be uploaded to the MasterStat via the USB port on the thermostat. Consult your local WaterFurnace representative or tech service for details.

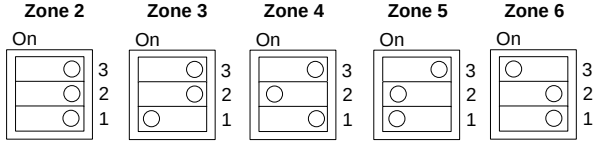
Wiring and Configuring the ZoneStats/SensorStats

The Zone Sensors should be wired with the MasterStat on Zone 1 using standard 4-wire thermostat cable (if issues with EMI, shielded cable should be used and grounded at the '–' terminal on one end). The other zones should be added sequentially on the relay board until complete. The dip switch on the back of each ZoneStat or SensorStat should be selected for the appropriate zone number; for instance, Zone 2 stat should be selected using the DIP switch on the back for 'off, off, off'.

ZoneStats/SensorStats PCB


SensorStat
IntelliZone2
Relay Board
On
3
2
1
Zone 5 Stat
A+
R
C
B-
Zone 5 code shown
P15 – Zone 5
Zone ID must be set for each Zone 2-6. ID cannot be confirmed on Zone SensorStat. See Zone ID Codes.
ZoneStat
Zone 3 Stat
Zone 4 code shown
P14 – Zone 4
Zone ID must be set for each Zone 2-6. ID can be confirmed on ZoneStat by pressing cancel button for 5 sec. ID shown on display. See Zone ID Codes.

Zone ID Codes



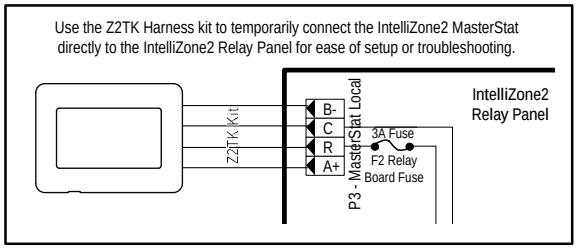
NOTES:

1) Zone ID must be set for each Zone 2-6. ID can be confirmed on ZoneStat by pressing cancel button for 5 sec. ID shown on display.
2) Small screw driver can be used to set ID thru protective plastic skin!
3) MasterStat always Zone 1. Zone ID not necessary.

IntelliZone2 Configuration cont.

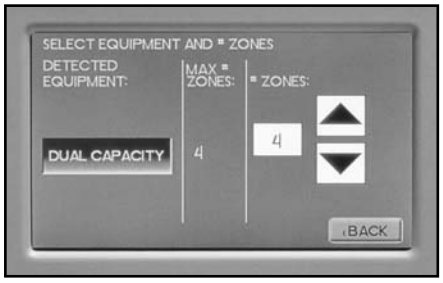
Once added to the Aurora system, the setup and configuration mode should be entered at the MasterStat by holding a finger over the IntelliZone2 logo for 5 sec. The Configuration and Setup mode will appear automatically.

It should be noted that the MasterStat Z2TK troubleshooting harness can be useful during setup by allowing the temporary connection of the MasterStat directly at the IntelliZone2 relay board for ease of configuration or servicing.


Use the Z2TK Harness kit to temporarily connect the IntelliZone2 MasterStat directly to the IntelliZone2 Relay Panel for ease of setup or troubleshooting.
Z2TK Kit
B-
C
R
A+
P3 - MasterStat Local
3A Fuse
F2 Relay Board Fuse
IntelliZone2 Relay Panel

Equipment and Number of Zones

The first screen is Equipment and # of Zones. Here the total number of desired zones and the type of equipment is selected. Equipment is automatically detected. Press the up and down arrows until the desired number of zones appears. **The zones should always be installed sequentially starting with the MasterStat always in Zone 1.**



- Single speed equipment Is limited to a maximum of 2 zones
- Dual Capacity equipment is limited to a maximum of 4 zones
- Variable speed equipment can have up to the maximum of 6 zones.

NOTE: If the number of zones selected Is less than 6, the remaining zones will be disabled.

Damper

The Damper screen allows the selection of either 2 wire (spring closed) or 3 wire (power open/power closed) type.

Staging

Staging allows custom selection of staging. Single/dual capacity selection is different than the variable speed selections.

The IntelliZone2 system allows four different staging options. Once the compressor call has been initiated by a zone, the compressor will be upstaged using one of four staging options in single or dual capacity equipment:

Single and Dual Staging

Normal - This “as shipped” mode will upstage the blower and compressor normally.

Quicker - This mode will upstage the blower, compressor and auxiliary electric heat more expediently than “normal” mode for increased comfort.

Faster - When heating, this mode will upstage the blower and auxiliary electric heat slightly faster than “quicker” mode. Cooling operation same as “quicker” mode.

Faster with Time EH - This mode allows for a timed element in compressor and electric heat upstaging in 45% and 70% zones for situations in which normal staging is inadequate when heating. **This staging position should be reserved for the most demanding and aggressive situations.** If the heat pump is already operating in the first stage, activate second stage after a 15-minute continuous H3 zone call from a 45% or 70% zone until the zone call is reduced to a H2. Airflow will be increased to speed tap 3 or

IntelliZone2 Configuration cont.

4 during this period. If the heat pump is already operating in second stage, activate third stage after a 15-minute continuous H3 zone call from a 45% or 70% zone until the zone call is reduced to a H2. Airflow will be increased to EH selection during this period. Cooling operation remains the same as “quicker” mode.

Variable Speed Staging

Normal - This “as shipped” mode will upstage the blower and variable speed compressor normally.

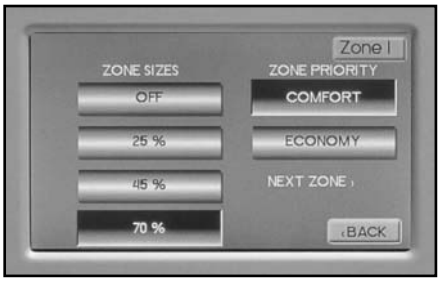
Quicker - This mode will upstage the blower, compressor and auxiliary electric heat more expediently than “normal” mode for increased comfort. Generally the compressor will be upstaged 1 extra speed more than normal.

Faster - When heating, this mode will upstage the blower and auxiliary electric heat slightly faster than “quicker” mode. Generally the compressor will be upstaged 2 extra speeds more than normal.

Faster with Time EH - This mode allows for a timed element in compressor and electric heat upstaging in 45% and 70% zones for situations in which normal staging is inadequate when heating. This staging position should be reserved for the most demanding and aggressive situations. If the heat pump is already operating in the first stage, activate second stage after a 15-minute continuous H3 zone call from a 45% or 70% zone until the zone call is reduced to a H2. Airflow will be increased to speed tap 3 or 4 during this period. If the heat pump is already operating in second stage, activate third stage after a 15-minute continuous H3 zone call from a 45% or 70% zone until the zone call is reduced to a H2. Airflow will be increased to EH selection during this period. Cooling operation remains the same as “quicker” mode.

Zone Configuration

Zone configuration allows the selection of the zone size and the zone priority. The zone can be selected by touching the upper right screen text noting the zone. In this way you can cycle thru all of the active zones to view the configuration.



Zone Percentage

Selecting the zone percentage can also be calculated by using the IntelliZone2 Calculator software. This percentage represents an approximation of the maximum heating or cooling load percentage of the zone and thus to a certain extent volume of airflow. The IntelliZone2 allows 0, 25, 45, and 70% selections. Some general rules to follow in this selection procedure are as follows:

- Pick the larger percentage for major living areas such as family rooms, etc.
- Pick the smaller percentage for minor living areas such as dens or bedrooms.
- Pick a larger percentage if more branches are required than the load indicates due to large area per load (i.e. unfinished insulated basement).
- The IntelliZone2 software should be used to aid in the selection and calculation of design cfm.
- The IntelliZone2 determines modes as a proportion of the total demand. A simple example of this to begin with is a two-zone system in the cooling mode. If each zone is set at 70% we have the following scenario:

  Zone 1 = 50%
  Zone 2 = 50%

NOTE: All Zone % calculations are ‘normalized using the following process: We now must determine what percentage of the total load each zone represents. To perform this operation, add the two zones together 70 + 70 = 140. One zone would then be 70/140 or 50%.

The IntelliZone2 then reduces the total demand based upon thermostat demand. A “Y1” call in the above chart will result in one half of the zone demand in this case 1/2 of 50% for a 25% system demand. A common complaint is insufficient cooling when only one zone is calling for cooling. The IntelliZone2 will not initiate a “Y2” output to the unit until it senses a 51% total system demand (This is when the IntelliZone2 is set for normal upstaging). If the IntelliZone2 is set for quicker upstaging it drops to 41%. By this example, it will require a “Y2” call from one zone (50%) and a “Y1” call from the second zone (25%). This will give us a total system demand of 50% + 25% = 75%. System demand for three- and four-zone systems are computed in the same manner.

Heating demand is determined in the same manner, but we now have a third stage instead of two for cooling. The IntelliZone2 assigns values as follows:

Y1 = 40%
Y2 = 80%
Y3 = 100%

We know from the previous example that the IntelliZone2 will initiate a “Y2” output to the compressor when it is set to normal upstaging and 51% of total demand is needed. It will issue a “W” call to the unit when there is a 90% total demand.

It is a common assumption that if you have a house with two zones equally divided each zone should be set at an

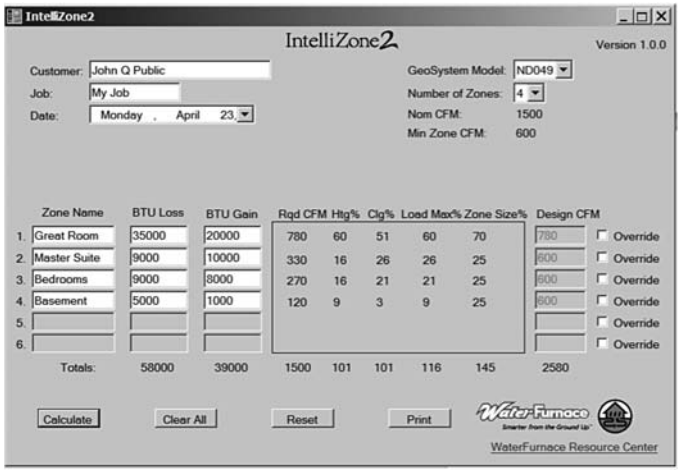
IntelliZone2 Configuration cont.

equal amount, usually 70%. As can be seen in the above chart, it will take a “Y3” call from one zone as well as a “Y2” call from the second zone to obtain auxiliary heat.

This is a simple example, but three- and four-zone systems are calculated in the same manner. Blower speeds are also assigned upon the percentage of system demand and a complete understanding of this process is not necessary for day-to-day decisions. As a serviceman, the temptation arises, in some instances, to influence the logic of the board by jumping “Y1” and “Y2”. While this will create a quicker response, the ductwork of that zone must be capable of handling the cfm delivered by the unit (i.e., if a “Y2” signal is given to the unit, can the ductwork handle the total cfm of the unit).

When setting up a new system remember that if you have unused zones they must be set to zero. If they are not, the setting that they have will be included in the total demand preventing the other zones from operating correctly, as there will be no inputs on those zones.

The IntelliZone2 allows the selection of either comfort or economy mode in each individual zone to provide maximum savings in areas that allow it (such as workshops and basements), while maintaining perfect comfort in the zones where accurate temperature is most desired (such as bedrooms and baths).


IntelliZone2
IntelliZone2
Version 1.0.0
Customer: John Q Public
Job: My Job
Date: Monday , April 23,
GeoSystem Model: ND049
Number of Zones: 4
Nom CFM: 1500
Min Zone CFM: 600
Zone Name BTU Loss BTU Gain Rqd CFM Htg% Clg% Load Max% Zone Size% Design CFM
1. Great Room 35000 20000 780 60 51 60 70 780 Override
2. Master Suite 9000 10000 330 16 26 26 25 600 Override
3. Bedrooms 9000 8000 270 16 21 21 25 600 Override
4. Basement 5000 1000 120 9 3 9 25 600 Override
5. Override
6. Override
Totals: 58000 39000 1500 101 101 116 145 2580
Calculate
Clear All
Reset
Print
WaterFurnace
WaterFurnace Resource Center

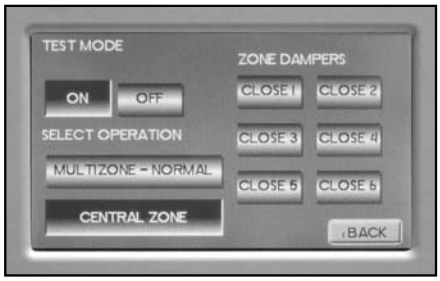
Zone Priority

Comfort Mode - A single zone call (Y1) for conditioning will engage the compressor and allow a minimal set point variation, thus providing ultimate comfort.

Economy Mode - A single zone call (Y1) for conditioning will be ignored by the IntelliZone2 until either a Y2 call is initiated from the same zone or another zone calls for conditioning (Y1). This allows a slightly greater set point variation than in comfort mode. This setting prevents less important zones from energizing the compressor unless it is really needed, thus saving money. As a bonus in this mode, upon a Y1 call, the IntelliZone2 may try to precondition the zone with return air from other zones already satisfied and, in some cases, can preclude the need for energizing the compressor.

Variable Speed Fan Staging - Variable Speed Fan Staging allows the ability to expand the blower levels. Options are Normal and Expanded. There are three airflow speeds assigned to a compressor speed and the airflow level is determined by the fan demand total zone %. Normal is the recommended airflow levels. Selecting Expanded will increase the highest airflow level by one level and decrease the lowest airflow level by one level from Normal. Not available for single speed or dual capacity models.

Test Mode - In Test mode ‘Central Zone’ mode can be selected. In Central mode all dampers are opened and thermostat readings are taken ONLY from the Zone 1 MasterStat. This will approximate operation without a zone system (all dampers open and IntelliZone2 MasterStat temperature control) and can be useful during initial construction of the home or during service etc.



Also in ‘Central Zone’ mode each damper can be individually cycled off/on to verify operation during Installation or service. It should be noted that the MasterStat Z2TK troubleshooting harness can be useful here by allowing the temporary connection of the MasterStat directly at the IntelliZone2 relay board for ease of configuration or servicing.

Aux Heat Lockout - Allows the configuration to lockout electric heat above a selected outdoor temperature. The outdoor sensor (OAT) must be installed on the IntelliZone2 Relay Board. **NOTE:** LAS = OAT on IntelliZone2 relay board.

IntelliZone2 Configuration cont.

Offsets
Temperature Offsets: Allows the calibration of Indoor, outdoor, and remote temperature readings.
Humidity Offset: Allows the calibration of humidity readings.

Humidity - Allows the configuration of humidify, dehumidify, both, or none.

Temperature Sensors - Allows the configuration of the remote sensor to be remote only, average of remote and internal, or no remote sensor. Allows the configuration of the outdoor sensor to be zone panel, MasterStat, or no outdoor sensor.

Accessories - Allows the configuration of the:
Air Filter Change: Cumulative run time or calendar time
Humidifier Change: Cumulative run time or calendar time
UV Lamp Change: Cumulative run time or calendar time
Air Cleaner Change: Cumulative run time or calendar time

Dealer Information - Allows the input of the dealer contact information.

Fault Status - Shows the last 10 IntelliZone2 system Faults (heat pump fault history is displayed at the heat pump on the AID Tool). The faults can be cleared or refreshed from this screen.

Restore Defaults - Restores the factory default settings.

Restart Thermostat/Upgrade Software - This allows a convenient way to restart the thermostat or upload the latest software using the USB port without killing power to the whole system.

USB - Allows the import and export of data using the USB port.
Importation of: Installer settings, User Settings, Program, Dealer Details
Exportation of: Installer settings, User Settings, Program, Dealer Details

Data Logging - Allows the USB thumb drive to record the data every 5 seconds.

Superboost (Variable Speed Heat Pumps ONLY) - Superboost can be found under the main menu settings of the thermostat. The Superboost option temporarily enables a larger cooling capacity range. Normal cooling mode is limited to compressor speeds 1-9 and Superboost allows compressor speeds 10-12 if needed. This screen will allow the homeowner to turn the Superboost option ON or OFF. The Superboost option will be enabled, by default, for a 24-hour period of time then will automatically be disabled. **NOTE:** Continuous use of SuperBoost could result in overheating the ground loop.

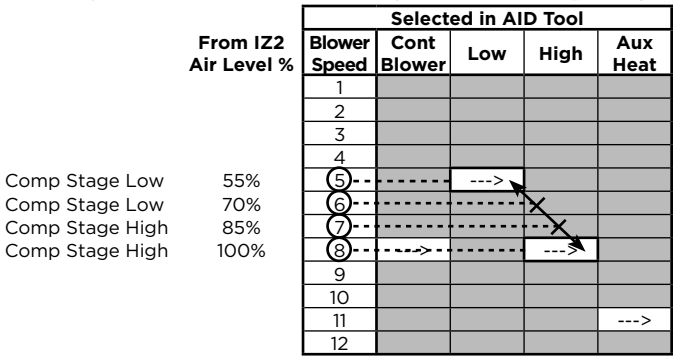
Dehumidification – Active - Active dehumidification will only activate during cooling operation, when cooling demand from the IntelliZone2 MasterStat is compressor speed 4 or lower and the humidity setpoint of the MasterStat is at least 5% below the actual relative humidity. The green status LED will flash code 2 when active. The compressor will ramp up and airflow will begin at a low level. Airflow is then reduced periodically until air coil temperature setpoint is reached. If coil temperature continues to drop, the airflow is increased until air coil setpoint is maintained. After 20 minutes of operation in the Active Dehumidification mode normal cooling operation will resume for 5 minutes. This cycle continues until the dehumidification setpoint is reached or IntelliZone2 MasterStat cooling demand requires greater than compressor speed 4 (normal cooling takes over). In IntelliZone2 systems, the main zone will remain open during active dehumidification.

Blower Data

Airflow Selection (Single or Dual Capacity)

Airflow from the Intellizone2 is communicated to the Aurora via a 'Blower Level %'. These blower levels are 55, 70, 85, and 100%. The Aurora will dictate actual airflow based upon these percentages. Below is a graphic showing how the IntelliZone2 would signal for a 55-100% blower level percent and the resulting airflow based upon the ABC setpoints of speed 5 for med and speed 8 for high in the example AID Tool setting. Notice that a blower level of 85% would result in a blower speed of 7 with these settings. All airflows are rounded to the nearest 1-12 blower speeds. Continuous blower and aux heat blower speeds are set Independently of the compressor blower speeds.

Heating Airflow Selection (Single or Dual Capacity)

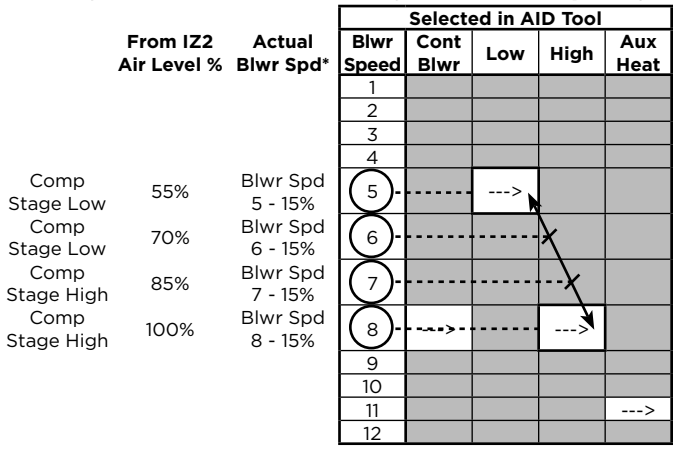


NOTES:

1) Continuous Blower activated by G only call from IntelliZone2 (selection can be anywhere)
2) Aux Heat Airflow activated by Aux or Emergency heat call (selection must be greater than high and allow proper airflow for the installed electric heat/heat pump model)

In cooling a similar procedure occurs with the exception that when dehumidification reduces airflow it is a reduction as shown below. Therefore in dehumidification mode, if blower speed 5 is selected the resulting airflow will be blower speed 5, less 15%. If cooling airflow is configured to be 15% less than heating airflow then there is no difference between cooling and dehumidification cooling airflow.

Cooling Airflow Selection (Single or Dual Capacity)


Selected in AID Tool
From IZ2 Air Level %
Actual Blwr Spd*
Blwr Speed
Cont Blwr
Low
High
Aux Heat
Comp Stage Low 55% Blwr Spd 5 - 15%
Comp Stage Low 70% Blwr Spd 6 - 15%
Comp Stage High 85% Blwr Spd 7 - 15%
Comp Stage High 100% Blwr Spd 8 - 15%
--->
-->

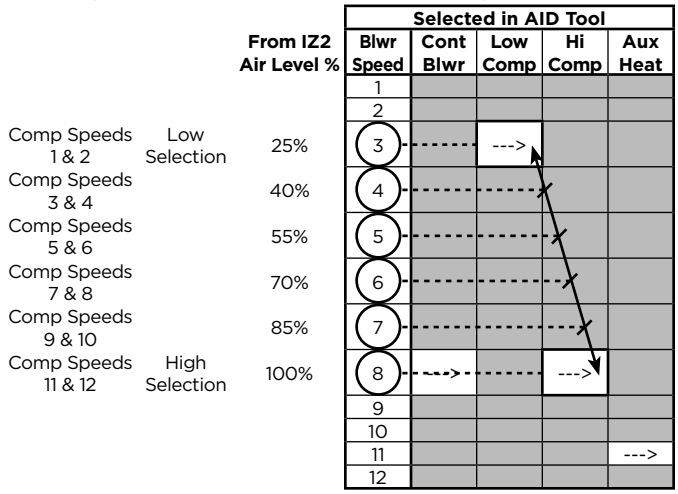
NOTES:

1) Continuous Blower activated by G only call from IntelliZone2 (selection can be anywhere)
2) Aux Heat Airflow activated by Aux or Emergency heat call (selection must be greater than high and allow proper airflow for the installed electric heat/heat pump model)

Airflow Selection (Variable Speed)

Airflow from the IntelliZone2 is communicated to the Aurora via a blower Level %. These blower levels are 25, 40, 55, 70, 85, and 100%. The Aurora will dictate actual airflow based upon these percentages. Below is a graphic showing how the IntelliZone2 would signal for a 25-100% blower level percent and the resulting airflow based upon the ABC setpoints of speed 3 for low and speed 8 for high in the example AID Tool setting. Notice that a Blower level of 85% would result in a blower speed of 7 with these settings. All airflows are rounded to the nearest 1-12 blower speeds. Continuous blower and aux heat blower speeds are set Independently of the compressor blower speeds.

Heating Airflow Selection (Variable Speed)


Selected in AID Tool
From IZ2 Air Level %
Blwr Speed
Cont Blwr
Low Comp
Hi Comp
Aux Heat
Comp Speeds 1 & 2 Low Selection 25%
Comp Speeds 3 & 4 40%
Comp Speeds 5 & 6 55%
Comp Speeds 7 & 8 70%
Comp Speeds 9 & 10 85%
Comp Speeds 11 & 12 High Selection 100%
--->
-->

Continued on the next page.

Blower Data cont.

In cooling a similar procedure occurs with the exception that compressor speed is limited to a maximum of speed 9. However compressor speed 10-12 is available for a short period of time and the resulting airflow during the 'SuperBoost' mode is shown below. Another exception is when dehumidification reduces airflow; it is a reduction as shown below. Therefore, in dehumidification mode, if blower speed 3 is selected, the resulting airflow will be blower speed 3, less 15%.

Cooling Airflow Selection (Variable Speed)

		From IZ2 Air Level %	Actual Blower Speed*
Comp Speeds 1 & 2	Low Selection	25%	Blower Spd 3 - 15%
Comp Speeds 3 & 4		40%	Blower Spd 4 - 15%
Comp Speeds 5 & 6		55%	Blower Spd 5 - 15%
Comp Speeds 7 & 8		70%	Blower Spd 6 - 15%
Comp Speeds 9 &10	Cooling Max	85%	Blower Spd 7 - 15%
Comp Speeds 11 & 12	SuperBoost Only	100%	Blower Spd 8 - 15%

Selected in AID Tool				
AID Reported Blower Speed	**Cont Blower**	**Low Comp**	**Hi Comp**	**Aux Heat**
1				
2				
3	--->			
4	--->			
5	--->			
6	--->			
7	--->			
8	--->		--->	
9				
10				
11				--->
12				

NOTE: * Denotes default cooling airflow setting of 15% less than heating mode airflow.

Dual or Single Capacity

Heating Unit Call	Blower Level Call (Norm)	Blower Level Call (Dehumid)
H1	55 or 70%	na
H2	85 or 100%	na
H2, W	Aux Blower	na
W	Aux Blower	na
G	G Only (cont Blower)	na
Cooling Unit Call	**Blower Level Call (Norm)**	**Blower Level Call (Dehumid)**
C1	55 or 70%	55 or 70% less 15% cfm
C2	85 or 100%	85 or 100% less 15% cfm
G	G Only (cont Blower)	G Only (cont Blower)

Variable Speed Capacity

Heating Unit Call	Blower Level Call (Normal Staging Shown)	Blower Level Call (Dehumid)
H1 or H2	25% or 40%	na
H3 or H4	25% or 40% or 55%	na
H5 or H6	40% or 55% or 70%	na
H7 or H8	55% or 70% or 85%	na
H9 or H10	70% or 85% or 100%	na
H11 or H12	85% or 100%	na
H9-H12, W	Aux Blower	na
W	Aux Blower	na
G	G Only (cont Blower)	na
Cooling Unit Call	**Blower Level Call (norm)**	**Blower Level Call (Dehumid)**
C1 or C2	25% or 40%	Norm less 15% cfm
C3 or C4	25% or 40% or 55%	Norm less 15% cfm
C5 or C6	40% or 55% or 70%	Norm less 15% cfm
C7 or C8	55% or 70% or 85%	Norm less 15% cfm
C9 or C10	70% or 85% or 100%	Norm less 15% cfm
C11 or C12	85% or 100%	Norm less 15% cfm
G	G Only (cont Blower)	G Only (cont Blower)

NOTE: C10-C12 are only available in SuperBoost mode.

Blower Data cont.

5 Series - Single Speed with 5-Speed ECM Motor

Model	Motor Speed	Motor Tap	T'stat Cnct.	Blower Size	Motor HP	Airflow (cfm) at External Static Pressure (in. wg)															
						0	0.05	0.10	0.15	0.20	0.25	0.30	0.35	0.40	0.45	0.50	0.60	0.70	0.80	0.90	1.00
	High	**5**	W			980	960	940	930	920	905	890	875	860	840	820	800	745	-	-	-
	Med High	**4**	Y1			890	878	865	845	825	813	800	785	770	753	735	710	665	-	-	-
022	Med	3		9 x 7	1/2	830	815	800	788	775	755	735	723	710	690	670	640	600	-	-	-
	Med Low	**2**	G			780	760	740	703	665	653	640	620	600	585	570	-	-	-	-	-
	Low	1				625	593	560	535	510	495	480	455	430	410	390	-	-	-	-	-
	High	5				1407	1381	1354	1327	1300	1267	1233	1201	1168	1131	1094	1009	-	-	-	-
	Med High	**4**	W			1146	1134	1122	1111	1099	1085	1071	1062	1052	1042	1031	966	-	-	-	-
030	**Med**	**3**	Y1	9 x 7	1/2	1023	1012	1001	985	969	959	949	937	925	913	901	-	-	-	-	-
	Med Low	2				978	962	946	934	922	907	891	882	872	858	843	-	-	-	-	-
	Low	**1**	G			795	777	759	748	737	718	698	686	673	650	626	-	-	-	-	-
	High	**5**	W			1530	1503	1476	1453	1429	1413	1397	1376	1355	1342	1329	1276	1231	1173	-	-
	Med High	**4**	Y1			1413	1388	1363	1342	1321	1303	1285	1263	1240	1226	1212	1173	1016	946	-	-
036	Med	3		11 x 10	1/2	1355	1325	1294	1276	1258	1235	1212	1188	1164	1144	1123	982	909	883	-	-
	Med Low	2				1336	1299	1261	1242	1222	1202	1181	1157	1132	1111	1090	937	874	830	-	-
	Low	**1**	G			1243	1182	1121	1061	1000	964	928	856	784	744	703	647	592		-	-
	High	5				1934	1910	1886	1871	1855	1827	1799	1780	1760	1747	1734	1700	1659	1617	-	-
	Med High	**4**	W			1799	1783	1767	1744	1720	1693	1666	1649	1631	1617	1603	1560	1530	1492	-	-
042	Med	3		11 x 10	1	1694	1680	1666	1642	1617	1592	1567	1552	1537	1519	1500	1453	1421	1372	-	-
	Med Low	2	Y1			1575	1560	1540	1520	1502	1487	1471	1448	1424	1409	1393	1351	1308	1266	-	-
	Low	1	G			1454	1406	1358	1333	1308	1285	1261	1239	1217	1198	1179	1072	1002	988	-	-
	High	5				1934	1910	1886	1871	1855	1827	1799	1780	1760	1747	1734	1700	1659	1617	-	-
	Med High	**4**	W			1799	1783	1767	1744	1720	1693	1666	1649	1631	1617	1603	1560	1530	1492	-	-
048	**Med**	**3**	Y1	11 x 10	1	1694	1680	1666	1642	1617	1592	1567	1552	1537	1519	1500	1453	1421	1372	-	-
	Med Low	2				1575	1560	1540	1520	1502	1487	1471	1448	1424	1409	1393	1351	1308	1266	-	-
	Low	**1**	G			1454	1406	1358	1333	1308	1285	1261	1239	1217	1198	1179	1072	1002	988	-	-
	High	**5**	W			2245	2230	2214	2194	2173	2155	2136	2120	2103	2087	2070	2032	1998	1957	1910	1825
	Med High	4				2092	2073	2054	2035	2015	1995	1975	1958	1940	1922	1904	1880	1843	1806	1767	1728
060	Med	3		11 x 10	1	1951	1931	1910	1889	1868	1850	1831	1812	1793	1774	1755	1722	1688	1654	1612	1562
	Med Low	**2**	Y1			1812	1796	1780	1761	1741	1718	1695	1682	1668	1651	1633	1591	1555	1518	1480	1433
	Low	**1**	G			1682	1661	1640	1616	1591	1573	1555	1533	1510	1495	1480	1441	1400	1351	1316	1263
	High	**5**	W			2472	2454	2435	2414	2393	2371	2349	2328	2306	2289	2271	2230	2189	2121	2033	1936
	Med High	**4**	Y1			2271	2248	2225	2205	2184	2166	2147	2129	2110	2094	2078	2039	2011	1977	1930	1846
070	Med	3		11 x 10	1	2133	2115	2096	2072	2047	2030	2013	1996	1979	1965	1950	1909	1873	1837	1793	1748
	Med Low	2				2008	1985	1962	1939	1915	1898	1880	1862	1843	1828	1812	1774	1742	1703	1669	1635
	Low	**1**	G			1806	1784	1761	1742	1722	1696	1669	1656	1642	1625	1607	1564	1527	1490	1443	1404

Factory speed settings are in Bold 6/14/12

Air flow values are with dry coil and standard filter

For wet coil performance first calculate the face velocity of the air coil (Face Velocity [fpm] = Airflow [cfm] / Face Area [sq ft]).

Then for velocities of 200 fpm reduce the static capability by 0.03 in. wg, 300 fpm by 0.08 in. wg, 400 fpm by 0.12in. wg., and 500 fpm by 0.16 in. wg.

Highest setting is for auxiliary heat (W) and lowest setting is for constant blower (G). The "Y1" and "Y2" settings must be between the "G" and "W" settings.

The gray wire is not factory wired to the motor and is tied to the wire harness. This wire can be field connected and can be used with 3ht/2cl thermostats or IntelliZone2 to deliver the required air flow for the Y2 signal.

5 Series - Dual Capacity with 5-Speed ECM

Model	Motor Speed	Motor Tap	T'stat Cnct.	Blower Size	Motor HP	Airflow (cfm) at External Static Pressure (in. wg)															
						0	0.05	0.10	0.15	0.20	0.25	0.30	0.35	0.40	0.45	0.50	0.60	0.70	0.80	0.90	1.00
	High	**5**	W			1120	1109	1097	1082	1066	1055	1044	1028	1011	1001	991	932	839	-	-	-
	Med High	**4**	Y2			1020	1006	991	980	968	950	932	922	911	894	876	849	812	-	-	-
026	Med	3		9 x 7	1/2	917	906	895	884	872	854	836	824	812	792	772	754	719	-	-	-
	Med Low	**2**	Y1			836	824	812	794	776	765	754	735	715	703	691	653	631	-	-	-
	Low	**1**	G			735	721	707	687	666	653	640	622	603	589	574	533	-	-	-	-
	High	**5**	W			1530	1503	1476	1453	1429	1413	1397	1376	1355	1342	1329	1276	1231	1173	-	-
	Med High	**4**	Y2			1413	1388	1363	1342	1321	1303	1285	1263	1240	1226	1212	1173	1016	946	-	-
038	**Med**	**3**	Y1	11 x 10	1/2	1355	1325	1294	1276	1258	1235	1212	1188	1164	1144	1123	982	909	883	-	-
	Med Low	2				1336	1299	1261	1242	1222	1202	1181	1157	1132	1111	1090	937	874	830	-	-
	Low	**1**	G			1243	1182	1121	1061	1000	964	928	856	784	744	703	647	592		-	-
	High	**5**	W			1934	1910	1886	1871	1855	1827	1799	1780	1760	1747	1734	1700	1659	1617	-	-
	Med High	4				1799	1783	1767	1744	1720	1693	1666	1649	1631	1617	1603	1560	1530	1492	-	-
049	**Med**	**3**	Y2	11 x 10	1	1694	1680	1666	1642	1617	1592	1567	1552	1537	1519	1500	1453	1421	1372	-	-
	Med Low	**2**	Y1			1575	1560	1540	1520	1502	1487	1471	1448	1424	1409	1393	1351	1308	1266	-	-
	Low	**1**	G			1454	1406	1358	1333	1308	1285	1261	1239	1217	1198	1179	1072	1002	988	-	-
	High	**5**	W			2245	2230	2214	2194	2173	2155	2136	2120	2103	2087	2070	2032	1998	1957	1910	1825
	Med High	**4**	Y2			2092	2073	2054	2035	2015	1995	1975	1958	1940	1922	1904	1880	1843	1806	1767	1728
064	Med	3		11 x 10	1	1951	1931	1910	1889	1868	1850	1831	1812	1793	1774	1755	1722	1688	1654	1612	1562
	Med Low	**2**	Y1			1812	1796	1780	1761	1741	1718	1695	1682	1668	1651	1633	1591	1555	1518	1480	1433
	Low	**1**	G			1682	1661	1640	1616	1591	1573	1555	1533	1510	1495	1480	1441	1400	1351	1316	1263
	High	**5**	W			2472	2454	2435	2414	2393	2371	2349	2328	2306	2289	2271	2230	2189	2121	2033	1936
	Med High	**4**	Y2			2271	2248	2225	2205	2184	2166	2147	2129	2110	2094	2078	2039	2011	1977	1930	1846
072	Med	3		11 x 10	1	2133	2115	2096	2072	2047	2030	2013	1996	1979	1965	1950	1909	1873	1837	1793	1748
	Med Low	**2**	Y1			2008	1985	1962	1939	1915	1898	1880	1862	1843	1828	1812	1774	1742	1703	1669	1635
	Low	**1**	G			1806	1784	1761	1742	1722	1696	1669	1656	1642	1625	1607	1564	1527	1490	1443	1404

Factory speed settings are in Bold 6/14/12

Air flow values are with dry coil and standard filter

For wet coil performance first calculate the face velocity of the air coil (Face Velocity [fpm] = Airflow [cfm] / Face Area [sq ft]).

Then for velocities of 200 fpm reduce the static capability by 0.03 in. wg, 300 fpm by 0.08 in. wg, 400 fpm by 0.12in. wg., and 500 fpm by 0.16 in. wg.

Highest setting is for auxiliary heat (W) and lowest setting is for constant blower (G). The "Y1" and "Y2" settings must be between the "G" and "W" settings.

Blower Data cont.

5 Series - Single Speed with Variable Speed ECM

Model	Max ESP	Blower Speed Settings with IntelliZone2 Blower Level Percentages											
		1	2	3	4	5	6	7	8	9	10	11	12
036	0.50	650	750	850 G	1000	**1100 L 55%**	**1200 70%-85%**	**1300 H 100%**	**1400**	**1500**	1550 Aux		
036 w/1hp*	0.75	800	1000 G	**1100 L 55%-70%**	**1300 H 85%-100%**	**1500**	**1600**	1800	1950	2100	2200 Aux		
042	0.50	650	800	900 G	1050	**1150 L 55%**	**1250 70%**	**1350 85%**	**1450 H 100%**	**1550**	1600 Aux		
042 w/1hp*	0.75	800	900 G	1000	**1200 L 55%-70%**	**1400 H 85%-100%**	**1600**	**1700**	**1850**	2000	2200 Aux	2300	2400
048	0.50	650	800	900	1050 G	1150	**1250**	**1350 L 55%**	**1450 70%-85%**	**1550 H 100%**	1600 Aux		
048 w/1hp*	0.75	800	900	1000 G	1200	**1400 L 55%-70%**	**1600 H 85%-100%**	**1700**	**1850**	2000	2200 Aux	2300	2400
060	0.75	800	950	1100 G	1300	**1500 L 55%**	**1750 70%-85%**	**1950 H 100%**	**2100**	**2300**	2325 Aux		
070	0.75	800	950	1100 G	1300	**1500**	**1750 L 55%**	**1950 70%-85%**	**2100 H 100%**	**2300**	2325 Aux		

Blower level percentages are shown with factory recommended blower speed settings 6/8/12
Factory settings are at recommended G-L-H-Aux speed settings
L-H settings MUST be located within boldface CFM range
"Aux" is factory setting for auxiliary heat and must be equal to or above the "H" setting as well as at least the minimum required for the auxiliary heat package
"G" may be located anywhere within the airflow table
CFM is controlled within 5% up to the maximum ESP
Max ESP includes allowance for wet coil and standard filter

5 Series - Dual Capacity with Variable Speed ECM

Model	Max ESP	Blower Speed Settings with IntelliZone2 Blower Level Percentages											
		1	2	3	4	5	6	7	8	9	10	11	12
026	0.50		400	500 G	600	**700 L 55%**	**800 70%-85%**	**900 H 100%**	**1000**	1100	1200 Aux		
038	0.50	650	750 G	850	1000	**1100 L 55%-70%**	**1200 H 85%-100%**	**1300**	**1400**	**1500**	1550 Aux		
038 w/1hp*	0.75	800 G	1000	**1100 L 55%-70%**	**1300 H 85%-100%**	**1500**	**1600**	1800	1875	1925	2000 Aux		
049	0.50	650	800 G	900	1050	1150	**1250**	**1350 L 55%**	**1450 70%-85%**	**1550 H 100%**	1575 Aux		
049 w/1hp*	0.75	800 G	900	1000	1200	**1400 L 55%-70%**	**1600 H 85%-100%**	**1700**	**1850**	2000	2200 Aux	2300	2400
064	0.75	800	950 G	1100	1300	**1500 L 55%**	**1750 70%-85%**	**1950 H 100%**	**2100**	**2300**	2325 Aux		
072	0.75	800	950	1100 G	1300	**1500**	**1750 L 55%**	**1950 70%-85%**	**2100 H 100%**	**2300**	2325 Aux		

Blower level percentages are shown with factory recommended blower speed settings 6/8/12
Factory settings are at recommended G-L-H-Aux speed settings
L-H settings MUST be located within boldface CFM range
"Aux" is factory setting for auxiliary heat and must be equal to or above the "H" setting as well as at least the minimum required for the auxiliary heat package
"G" may be located anywhere within the airflow table
CFM is controlled within 5% up to the maximum ESP
Max ESP includes allowance for wet coil and standard filter

7 Series - Variable Speed with Variable Speed ECM

Model	Max ESP	7 Series Blower Speed Settings with IntelliZone2 Blower Level Percentages											
		Speed 1	Speed 2	Speed 3	Speed 4	Speed 5	Speed 6	Speed 7	Speed 8	Speed 9	Speed 10	Speed 11	Speed 12
036	0.50	**285**	**380 G**	**525 L 25%**	**675 40%**	**815**	**980 55%**	1100 70%	1220	1330 85%	1440 H 100%	1540 Aux	1575
036 w/1hp*	0.75	**480**	**565 G**	**665 L 25%**	**761 40%**	**870**	**1000 55%**	1100 70%	1200	1300 85%	1410 H 100%	1520 Aux	1630
048	0.75	**475**	**620 G**	**730 L 25%**	**850 40%**	**1020**	**1140 55%**	1270 70%	1400	1520 85%	1650 H 100%	1790 Aux	1925
060	0.75	**400**	**600 G**	**830 L 25%**	**1050 40%**	**1230**	**1400 55%**	1560 70%	1700	1870 85%	2010 H 100%	2140 Aux	2265
****VS Compressor Speed**				1-2	3-4		5-6	7-8		9-10	11-12		

Blower level percentages are shown with factory recommended blower speed settings 6/7/12
** VS Compressor speed is given for the factory default cfm settings. When the cfm default settings are changed it will change the relationship to the compressor speed that is shown in the table. In cooling mode compressor speeds 10-12 are only available when SuperBoost mode is selected at the thermostat.
* optional 1 HP ECM
Factory speed settings are at recommended G, L , H and Aux positions
"G" may be located anywhere within the airflow table
"L" setting should be located within the boldface CFM range
"H" setting MUST be located within the shaded CFM range
"Aux" setting MUST be equal to or greater than the minimum allowable CFM for the auxiliary heater kit (see auxiliary heat ratings table)
CFM is controlled within 5% up to the maximum ESP
Max ESP includes allowance for wet coil and standard filter

IntelliZone2 CFM Design

Model	Max CFM	Zone Design CFM	CFM Percentage
NS030	1000	700	50
NS036	1200	850	50
NS042	1300	900	50
NS048	1500	1000	50
NS060	1800	1100	50
NS070	2000	1100	50
ND026	800	600	40
ND038	1200	600	40
ND049	1500	800	40
ND064	1800	950	40
ND072	2000	1100	40
NV036	1500	300	20
NV048	1800	450	20
NV060	2100	450	20

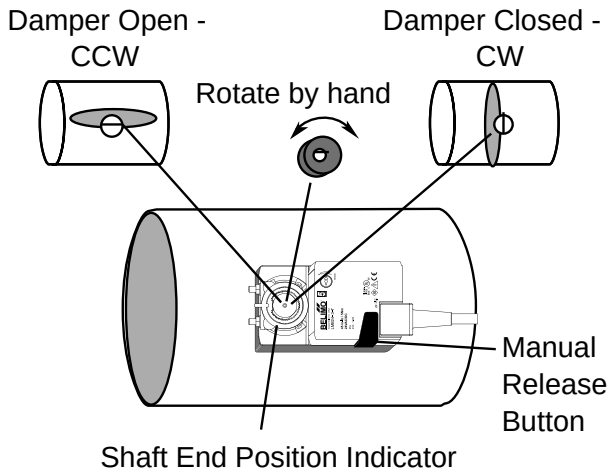
System Startup and Checkout

It should be noted that the MasterStat Z2TK troubleshooting harness can be useful during startup by allowing the temporary connection of the MasterStat directly at the IntelliZone2 relay board for ease of configuration or servicing.

Before powering the unit, check the following:

- Fuses, breakers and wire size are correct.
- Low voltage wiring has been completed.
- MasterStat has been configured correctly.
- Thermostats are wired and DIP switches are set for proper zone #.
- Blower speed has been set on the AID Tool.
- Aurora control is configured for IntelliZone2.

Figure 25: Checking the Shaft Position Indicator



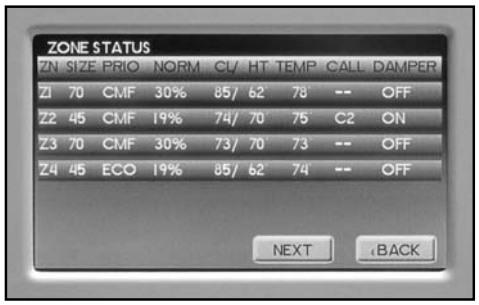
Damper and Continuous Blower Checkout

1. Push the “Fan” button to the ON position on all thermostats. (alternate method shown in the note below)
2. All dampers should start to open immediately.
3. The blower should come on continuous fan speed and should illuminate the “G” LED only; all other fan speed LEDs should be off.
4. After approximately 90 seconds, all IntelliZone2 dampers should be completely opened. Check the shaft position indicator on all damper actuators as shown in Figure 25.
5. Push the “Fan” button to the OFF position on all thermostats.
6. The blower and the “G” LED should cycle off.
7. All dampers should start to close immediately. After approximately 90 seconds, all dampers should be completely closed. Check the shaft position indicator on all damper actuators shown in Figure 25.

NOTES: To cycle dampers open and closed, access the ‘Test Mode’ Screen in the Installer Setup mode on the IntelliZone2 MasterStat. Once here each damper can be cycled individually by pushing the specific zone damper button to check for proper operation. “Central Zone” mode can also be used to open all dampers.

System Startup and Checkout cont.

In the following procedure, check for proper calls on the Status Screen.


ZONE STATUS
ZN SIZE PRIO NORM CL/ HT TEMP CALL DAMPER
Z1 70 CMF 30% 85/ 62 78 -- OFF
Z2 45 CMF 19% 74/ 70 75 C2 ON
Z3 70 CMF 30% 73/ 70 73 -- OFF
Z4 45 ECO 19% 85/ 62 74 -- OFF
NEXT
BACK

System Checkout

1. Set all of the zone thermostats to the cooling mode.
2. Reduce the cooling set point to 2° below the actual zone temperature on all thermostats.
3. First stage cooling should energize after a delay.
4. Be sure the compressor and blower are activated. Check the fan speed LEDs and compare to the Blower Speed tables.
5. Decrease the cooling set point two more degrees and check to see that the fan speed increases and second stage cooling is energized (Y1, Y2, and O LEDs). Check the fan speed LEDs and compare to the Blower Speed tables.
6. Adjust the thermostats until the temperature displayed is 5° higher than the actual temperature on all thermostats.
7. The call for cooling should be canceled after a delay.
8. Set all of the zone thermostats to the heating mode.
9. Increase the heating set point to 2° above the actual zone temperature on all thermostats.
10. After a delay, the unit should start up in the first stage heating mode (H1). Check the fan speed LEDs and compare to the Blower Speed tables.
11. Increase the heating set points two more degrees and check to see that the fan speed increases and second stage heating is energized (H2). Check the fan speed LEDs and compare to the Blower Speed table.
12. Increase the heating set point to 4° above the actual zone temperatures. Be sure the auxiliary heat is energized and the fan speed increases (Y1, Y2, and W). Check the fan speed LEDs and compare to the Blower Speed tables.
13. Set system to maintain desired comfort level.
14. Instruct the owner/operator of correct thermostat and system operation.
15. Fill out and forward all warranty registration papers to WaterFurnace.

NOTE: Unit check out can be accomplished by going to the Test Mode screen at the MasterStat and selecting Central Zone. The system will be controlled only by the MasterStat. Any time superheat and subcooling is being checked, the zone system must be in the central zone mode.

Blower Speed Tables

Single or Dual Capacity

Heating Unit Call	Blower Level Call (Norm)	Blower Level Call (Dehumid)
H1	55 or 70%	N/A
H2	85 or 100%	N/A
H2, W	Aux Blower	N/A
W	Aux Blower	N/A
G	G Only (Cont Blower)	N/A
Cooling Unit Call	**Blower Level Call (Norm)**	**Blower Level Call (Dehumid)**
C1	55 or 70%	55 or 70% less 15% cfm
C2	85 or 100%	85 or 100% less 15% cfm
G	G Only (Cont Blower)	G Only (Cont Blower)

Variable Speed Capacity

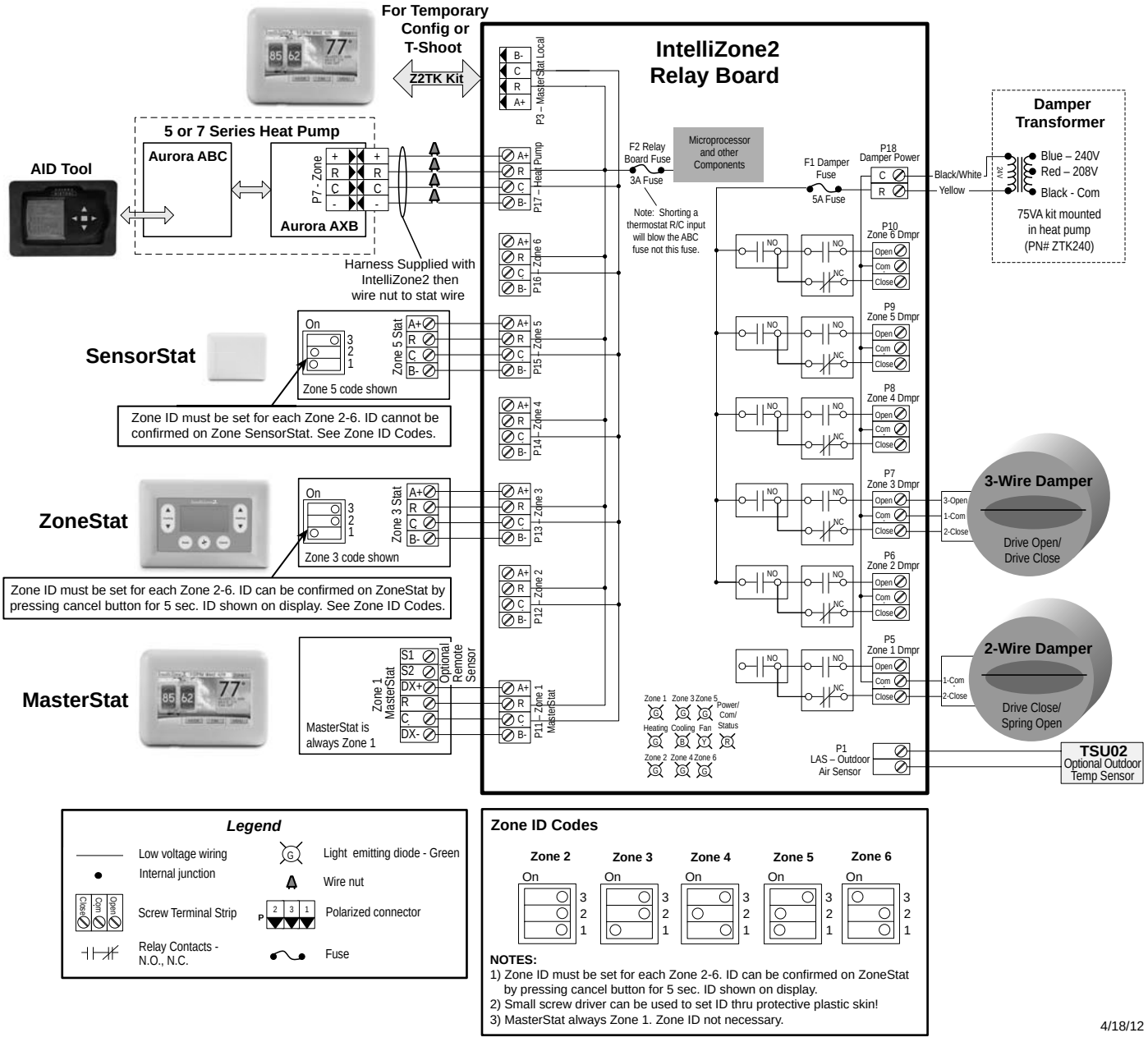
Heating Unit Call	Blower Level Call (Normal Staging Shown)	Blower Level Call (Dehumid)
H1 or H2	25%	N/A
H3 or H4	40%	N/A
H5 or H6	55%	N/A
H7 or H8	70%	N/A
H9 or H10	85%	N/A
H11 or H12	100%	N/A
H9-H12, W	Aux Blower	N/A
W	Aux Blower	N/A
G	G Only (Cont Blower)	N/A
Cooling Unit Call	**Blower Level Call (Norm)**	**Blower Level Call (Dehumid)**
C1 or C2	25%	25% less 15% cfm
C3 or C4	40%	40% less 15% cfm
C5 or C6	55%	55% less 15% cfm
C7 or C8	70%	70% less 15% cfm
C9 or C10	85%	85% less 15% cfm
C11 or C12	100%	100% less 15% cfm
G	G Only (Cont Blower)	G Only (Cont Blower)

IntelliZone2 Configuration

Once added to the Aurora control system, the setup and configuration mode should be entered at the MasterStat by holding a finger on the IntelliZone2 logo for 5 seconds. The Configuration and Setup mode will appear automatically.

Wiring Schematic

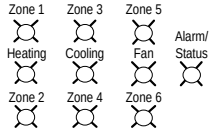
IntelliZone2 System


For Temporary Config or T-Shoot
Z2TK Kit
IntelliZone2 Relay Board
5 or 7 Series Heat Pump
Aurora ABC
Aurora AXB
AID Tool
P7 - Zone
Harness Supplied with IntelliZone2 then wire nut to stat wire
SensorStat
Zone 5 code shown
Zone ID must be set for each Zone 2-6. ID cannot be confirmed on Zone SensorStat. See Zone ID Codes.
ZoneStat
Zone 3 code shown
Zone ID must be set for each Zone 2-6. ID can be confirmed on ZoneStat by pressing cancel button for 5 sec. ID shown on display. See Zone ID Codes.
MasterStat
MasterStat is always Zone 1
Optional Remote Sensor
P3 – MasterStat Local
P17 – Heat Pump
P16 – Zone 6
P15 – Zone 5
P14 – Zone 4
P13 – Zone 3
P12 – Zone 2
P11 – Zone 1 MasterStat
F2 Relay Board Fuse
3A Fuse
Note: Shorting a thermostat R/C input will blow the ABC fuse not this fuse.
Microprocessor and other Components
F1 Damper Fuse
5A Fuse
P18 Damper Power
Damper Transformer
Black/White
Yellow
Blue – 240V
Red – 208V
Black - Com
75VA kit mounted in heat pump (PN# ZTK240)
P10 Zone 6 Dmpr
P9 Zone 5 Dmpr
P8 Zone 4 Dmpr
P7 Zone 3 Dmpr
P6 Zone 2 Dmpr
P5 Zone 1 Dmpr
3-Wire Damper
Drive Open/ Drive Close
2-Wire Damper
Drive Close/ Spring Open
Zone 1 Zone 3 Zone 5 Power/ Com/ Status
Heating Cooling Fan
Zone 2 Zone 4 Zone 6
P1 LAS – Outdoor Air Sensor
TSU02 Optional Outdoor Temp Sensor
Legend
Low voltage wiring
Internal junction
Screw Terminal Strip
Relay Contacts - N.O., N.C.
Light emitting diode - Green
Wire nut
Polarized connector
Fuse
Zone ID Codes
Zone 2
Zone 3
Zone 4
Zone 5
Zone 6
NOTES:
1) Zone ID must be set for each Zone 2-6. ID can be confirmed on ZoneStat by pressing cancel button for 5 sec. ID shown on display.
2) Small screw driver can be used to set ID thru protective plastic skin!
3) MasterStat always Zone 1. Zone ID not necessary.
4/18/12

NOTE: This drawing is for visual reference for wiring and configuring a zone. Do not skip zones as shown here. Zones MUST be wired in numerical sequence.

IntelliZone2 Fault Codes

The following are IntelliZone2 fault codes that can appear on the IntelliZone2 relay board LEDs and MasterStat. All Aurora control errors will be displayed on the MasterStat as “Exx” (xx equals error number) style and fault information can be found in AID Tool and Aurora Control literature.



Power/Com LED Codes

Flash Code	Description
On	No Faults
Flashing	Communications Error
Code 1	No Damper Power
Code 2	Voltage < 19 V
Code 3	Voltage <16 V
Code 4	OAT Shorted
Code 5	OAT Open

ZONE LED Codes

Flash Code	Description
Off	Damper Closed
On	Damper Open
Flashing	Damper Moving

Other LED Codes

LED Code	Description
Heat On	Heating Mode
Cool On	Cooling Mode
Fan On	Fan Only Mode

IZ2 MasterStat Errors (displayed on Master Stat)

Code	Description
Z1-1	Humidity Temp Sensor Open
Z1-2	Humidity Temp Sensor Shorted
Z1-3	Outdoor Temp Sensor Error
Z1-4	Humidity Reading too Low
Z1-5	Humidity Reading too High
Z1-6	Humidity Sensor Failure
Z1-8	Remote Room Sensor Error
Z1-9	Primary Temp Sensor Open
Z1-10	Primary Temp Sensor Shorted
Z1-11	Temp Reading Too Low
Z1-12	Temp Reading Too High
Z1-13	AXB Control no Communications
Z1-14	Low Voltage under 19 VAC
Z1-15	Low Voltage under 16 VAC
Z1-97	IntelliZone2 Panel no Communications
Z1-98	Zone 2 Sensor no Communications
Z1-99	Zone 3 Sensor no Communications
Z1-100	Zone 4 Sensor no Communications
Z1-101	Zone 5 Sensor no Communications
Z1-102	Zone 6 Sensor no Communications

NOTES: 1) Where * equals the number of the zone.
2) Example: Z3-4 = Zone 3 Sensor Control Error

IZ2 Sensor Errors (displayed on Master Stat)

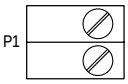
Code	Description
Z*-4	Zone Sensor Control Failure
Z*-6	Zone Sensor Temperature Reading Difference
Z*-8	Primary Temp Sensor Shorted
Z*-9	Primary Temp Sensor Open
Z*-10	Secondary Temp Sensor Shorted
Z*-11	Secondary Temp Sensor Open
Z*-14	Temp above 99 degF
Z*-15	Temp Below 40 degF
Z*-16	Temp 2 above 99 degF
Z*-17	Temp 2 below 40 degF
Z*-19	Low Voltage below 19VAC
Z*-20	Low Voltage below 16VAC

IZ2 Panel Errors (on Master Stat)

Code	Description
ZP-1	No Damper Power
ZP-2	Low Voltage Below 19 VAC
ZP-3	Low Voltage Below 16 VAC
ZP-4	OAT Sensor Shorted
ZP-5	OAT Senser Open

NOTE: Example: ZP-4 = Zone Panel OAT Sensor Shorted

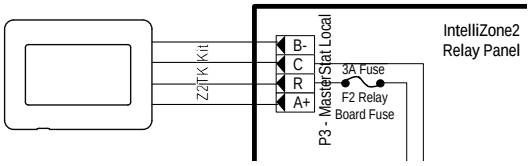
NOTE: E Codes diplayed on the IntelliZone2 MasterStat originate from the heat pump. i.e. “E11 = Freeze Detection Sensor Error”



LAS = OAT

TSU02
Optional Outdoor
Temp Sensor

Use the Z2TK Harness kit to temporarily connect the IntelliZone2 MasterStat directly to the IntelliZone2 Relay Panel for ease of setup or troubleshooting.



Manufactured by
WaterFurnace International, Inc.
9000 Conservation Way
Fort Wayne, IN 46809
www.waterfurnace.com

Product: **IntelliZone2**
Type: Comfort Zoning System
Size: Six Zone Capability
Document: Installation Manual

PROUD MEMBER

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IM1578EW 07/12